Claims

1. A positron emission tomography camera or scanner comprising:

a patient area,

a detector ring for detecting radiation from opposite sides of the patient area, the ring including a plurality of scintillation detectors directed towards the patient area, the scintillation detectors being such as to emit light when radiation is incident thereon, and

converting means optically coupled to the scintillation detectors for converting light emitted by the scintillation detectors to electrical pulses,

wherein each of the plurality of scintillation detectors comprises lutetium-yttrium-aluminate-perovskite, $Lu_xY_{1-x}AP$ (where $0.5 \leq x \leq 0.995$).

2. The positron emission tomography camera or scanner of claim 1, wherein each of the scintillation detectors comprise at least one further scintillating layer.

3. The positron emission tomography camera or scanner of claim 1, wherein each of the scintillation detectors comprise at least one further layer of material disposed adjacent the lutetium-yttrium-aluminate-perovskite , the said material comprising one of the group comprising LSO, GSO, BGO, LGSO, YAP, YSO and LYSO.

4. The positron emission tomography camera or scanner of claim 1, wherein each of the scintillation detectors comprise said $Lu_xY_{1-x}AP$ as a first layer and at least one further layer disposed adjacent the first layer, the further layer comprising $Lu_xY_{1-x}AP$ wherein for said at least one further layer the value of x

is selected to provide appropriate differences in the time constant to the time constant of the $Lu_xY_{1-x}AP$ of the first layer.

5. The camera or scanner of claim 2, wherein determining means are provided for determining whether detected radiation was incident on the lutetium-yttrium-aluminate-perovskite or the at least one further layer.

6. The camera or scanner of claim 3, wherein the determining means are operable to analyse the electrical signal to determine a pulse shape, the pulse shape being indicative of whether detected radiation was incident on the lutetium-yttrium-aluminate-perovskite or the at least one further layer.

7. The camera or scanner of claim 2, further comprising a respective optical element disposed between each scintillation detector and its associated converting means, the optical element being such that light from the lutetium-yttrium-aluminate-perovskite is affected in one way and light from the at least one further layer is affected in another way.

8. The camera or scanner of claim 2, further comprising at least one optical element, the optical element being disposed to receive light from at least two scintillation detectors and being constructed and arranged so that light from the lutetium-yttrium-aluminate-perovskite is affected in one way and light from the at least one further layer is affected in another way.

9. The camera or scanner of claim 7, wherein the optical element is a wavelength divider.

10. The camera or scanner of claim 9, wherein the wavelength divider comprises at least one of the group comprising a glass filter, an interference filter, a diffraction grating, a prism, a diffractive micro-optic array and a refractive micro-optic array.

11. The camera or scanner of claim 8, wherein the optical element is a wavelength divider.

12. The camera or scanner of claim 11, wherein the wavelength divider comprises at least one of the group comprising a glass filter, an interference filter, a diffraction grating, a prism, a diffractive micro-optic array and a refractive micro-optic array.

13. The camera or scanner of claim 1, wherein the converting means comprise at least one photomultiplier tube.

14. The camera or scanner of claim 13, wherein the or each photomultiplier tube is position sensitive.

15. The camera or scanner of claim 1, wherein the converting means comprise one of photodiodes and avalanche photodiodes.

16. The camera or scanner of claim 11, wherein the converting means comprise one of silicon photodiodes and avalanche silicon photodiodes.

17. A positron emission tomography camera or scanner comprising a plurality of scintillators, wherein the scintillators comprise lutetium-yttrium-aluminate-

perovskite, $Lu_xY_{1-x}AP$ (where $0.5 \leq x \leq 0.995$).

18. A camera or scanner as claimed in claim 17, wherein the scintillators additionally comprise a layer of material positioned adjacent the lutetium-yttrium-aluminate-perovskite, wherein said material comprises one of the group comprising LSO, GSO, BGO, LGSO, YAP, YSO and LYSO.

19. A scintillator for use in the camera or scanner as claimed in claim 1, wherein the scintillator comprises lutetium-yttrium-aluminate-perovskite, $Lu_xY_{1-x}AP$ (where $0.5 \leq x \leq 0.995$).